SUBSTITUTE SPECIFICATION
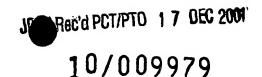
TITLE OF THE INVENTION

COMPUTER-AIDED METHOD FOR PARALLEL CALCULATION OF THE OPERATING POINT OF ELECTRICAL CIRCUITS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is based on and hereby claims priority to German Application No. 199 27 301.4 filed on June 15, 1999 in Germany, and PCT Application No. PCT/DE00/017754 filed on May 30, 2000, the contents of which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The computer-aided simulation of electrical circuits has attained increasing importance in the development of very large circuits, that is to say circuits having a very large number of elements. It is particularly in the development of computer chips having a multiplicity, for example several hundred thousand transistors, that serial processing for the determination of the circuit quantities by a computer has been found to be unusable because of the excessive time consumption.

[0003] In WO 98/24039, therefore, it is proposed to partition a large circuit and to have the partitions processed by different computers in each case.

[0004] In the calculation, the operating point, that is to say the potentials of all nodes is usually determined first as basis for further analyses such as, for example, transient or alternating-current analyses.

[0005] For the parallel calculation, an implementation of the Newton method is proposed in U. Wever, Q. Zheng et al.: "Domain Decomposition Methods for Circuit Simulation" (Proceedings of the 8th Workshop on Parallel and Distributed Simulation, PADS '94 Edinburgh, Scotland, UK, pp. 183-186, July 1994) and in U. Wever, Q. Zheng: "Parallel Transient Analysis for Circuit Simulation" (Proceedings of the 29th Annual Hawaii International Conference on System Sciences, pp. 442-447, 1996). The disadvantage is that convergence can only be achieved here when sufficiently good estimates of the operating point are available, due to poor convergence characteristics. As a rule, however, such good estimates can be achieved with difficulty or not at all in the case of large circuits.

SUMMARY OF THE INVENTION